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375 | 146, 147

**WHAT IS CLAIMED IS:**

1. A band-division demodulation method in which a transmission band of a received RF signal is band-divided into a plurality, each of signals said band-divided is OFDM-demodulated, and said demodulation results are synthesized,

wherein the received RF signal is in-phase-distributed to said band division number, the band width that the entire band width of said received RF signal is divided by said band division number is used as a unit band width, each signal ~~said distributed so as to be shifted stepwise by integral times of said unit band width is frequency-converted~~ each signal ~~said frequency-converted is allowed to band-pass by filtering with the same characteristics to perform a band division, and said~~ <sup>over</sup> signal allowed to band-pass is OFDM demodulated.

~~see fig~~

2. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

a distribution section for receiving <sup>said</sup> RF signal and in-phase-distributing it to said band division number;

a frequency conversion section for using, as a unit  
band width, the band width<sup>so th</sup> that the entire band width of said  
received RF signal is divided by said band division number,  
and frequency-converting each signal said distributed so as

to be shifted stepwise by integral times of said unit band width;

a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same  
5 characteristics;

an OFDM demodulation section for OFDM-demodulating  
said signal allowed to band-pass; and

a synthesizing section for synthesizing an output from said OFDM demodulation section to output demodulated data.

3. The OFDM receiver according to claim 2, wherein said band-pass filter section is a band-pass filter section of the same characteristics for allowing a frequency band that each signal said frequency-converted has in common.

4. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

20 a first frequency conversion section for receiving  
*(when plurality of)*  
said RF signal and converting it into a first IF frequency band;

*(or plurality)*  
25 an AGC section for adjusting an output signal from said first frequency conversion section to a certain constant output level and outputting it;

an in-phase distributor for in-phase-distributing an

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output from said AGC section into said band width division <sup>in</sup>  
number; *(of the plurality of frequency conversion sections)*

5 a second frequency conversion section for using, as <sup>such</sup> <sub>in</sub>  
a unit band width, the band width <sup>that</sup> the entire band width <sup>is</sup>  
of said received RF signal is divided by said band division <sup>in</sup>  
number, and frequency-converting each output from said in-  
phase distributor <sup>so as to be shifted stepwise by</sup> integral <sup>17</sup>  
times of said unit band width; *(of the plurality of*

10 a band-pass filter section for allowing each signal  
said frequency-converted to band-pass with the same  
characteristics;

15 a third frequency conversion section for frequency-  
converting said each band-pass signal into a second IF  
frequency band;

an OFDM demodulation section for OFDM-demodulating  
an output from said third frequency conversion section; and

20 a P/S section for parallel-to-series-converting and  
synthesizing an output from said each OFDM demodulation  
section.

25 5. An OFDM receiver in which a transmission band of  
a received RF signal is band-divided into a plurality, each  
of signals said band-divided is OFDM-demodulated, and said  
demodulation results are synthesized, comprising:

an AGC section for receiving an RF signal, adjusting  
it to a certain constant output level, and outputting it;

an in-phase distributor for in-phase-distributing an

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output from said AGC section into said band width division number;

5            a fourth frequency conversion section for frequency-converting each output from said in-phase distributor, using, as a unit band width, the band width that the entire band width of said received RF signal is divided by said band division number, and frequency-converting each output from said in-phase distributor so as to be shifted stepwise by integral times of said unit band width;

10            a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same characteristics;

15            a fifth frequency conversion section for frequency-converting said each band-pass signal into a second IF frequency band;

20            an OFDM demodulation section for OFDM-demodulating an output from said fifth frequency conversion section; and

25            a P/S section for parallel-to-series-converting and synthesizing an output from said each OFDM demodulation section.

6. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

an AGC section for receiving an RF signal, adjusting it to a certain constant output level, and outputting it;

an in-phase distributor for in-phase-distributing an output from said AGC section into said band width division number;

5 a fourth frequency conversion section for frequency-converting each output from said in-phase distributor, using, as a unit band width, the band width that the entire band width of said received RF signal is divided by said band division number, and frequency-converting each output from said in-phase distributor so as to be shifted stepwise by integral times of said unit band width;

a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same characteristics;

10 an OFDM demodulation section for inputting an output from said band-pass filter section, under-sampling it by a frequency lower than a usual sampling frequency in accordance with the frequency of said input signal to convert it into a digital signal, and OFDM-demodulating it; and

15 a P/S section for parallel-to-series-converting and synthesizing an output from said each OFDM demodulation section.

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25 7. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according

to claim 2.

8. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 3.

9. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 4.

10. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 5.

11. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according  
to claim 6.

12. A multi-carrier transmission system having a  
transmitter for OFDM-modulating and transmitting a  
transmission signal, and a receiver for receiving and OFDM-  
demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according  
to claim 7.

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ABSTRACT OF THE DISCLOSURE

The present invention provides a band-division demodulation method and an OFDM receiver in which, by equalizing the characteristics of band-pass filters for parallel processing by band division, the development costs of the band-pass filters can be relieved and it can be constructed economically. They are the band-division demodulation method and the OFDM receiver in which an RF signal is in-phase-distributed in an in-phase distributor into a band division number, in local oscillators and a frequency conversion section, the band width that the entire band width of the received RF signal is divided by the band division number is used as a unit band width, and each signal distributed so as to be shifted stepwise by integral times of the unit band width is frequency-converted, and each signal frequency-converted is allowed in BPF to band-pass with the same characteristics, and then OFDM-demodulated in an OFDM demodulation section.